How To Use The Interactive Drifter Trajectory Tool (November 2010)

This web-based interactive drifter trajectory tool is designed to allow users to release virtual drifters at any location within the available domain and obtain the drifting trajectory over a selected time period in the past, present or future.

There are two options to release virtual drifters: (1) Single Drop Mode, and (2) Multiple Drop Mode. For the Single Drop Mode, users can release one or more drifters, by clicking a location on the map or entering the longitude and latitude for the drifter location. For the Multiple Drop Mode, users can draw a rectangle on the map by clicking and dragging, then specify the number of drifters in an X by Y configuration. The default option is set for 9 drifters in a 3x3 configuration but this can be changed by users (e.g. 20 drifters in a 4x5 configuration). You cannot release a drifter over land.

After specifying the drifter release location, users can select the data source to be used.   At this time, the only data available are from the Regional Ocean Modeling System (ROMS) forecasting system for Monterey Bay (MB) with a spatial resolution of 1.6 km beginning October 4, 2010. The ROMS hourly surface current fields are derived from the ROMS forecast initialized at 3 GMT with the ROMS analysis (or nowcast) as the initial condition. The most recent ROMS forecast covers a 48-hour period, while only the first 24-hour ROMS forecast is used to construct the historical time-series.

After adding drifters, selecting the data source and setting the drifting period (start and end time), click "Compute & Plot" to obtain the drifter trajectory. If a drifter trajectory hits land or is drifted outside the data domain, the trajectory will stop.

The computation and trajectory plotting time varies depending on a number of factors (e.g., the number of drifters, drifting period, workload on the centralized computing server, internet bandwidth) but it is usually less than one minute. The data are also available by clicking the "Download Trajectory File" where a pop-up window displays the calculated hourly drifter locations in longitude and latitude (ASCII file format). If needed, use the "clear" button to erase the drifter and plotted trajectory and repeat the process until satisfactory trajectories are achieved.

About the ROMS forecasting system

It should be pointed out that ROMS assimilates high frequency (HF) radar surface current data (http://sdf.ndbc.noaa.gov:8080/thredds/catalog.html) as well as satellite sea surface temperature (http://ourocean.jpl.nasa.gov/SST) and in situ observations including CTD profiles from moorings, ships, gliders and ARGO floats (when they are available within the ROMS domains), sea surface temperature and salinity from surface drifters. We plan to continue improving this product. We will soon expand the tool to cover domains beyond Monterey Bay in central and northern California. We will also add the observed HF radar surface current data in areas where a gap-free product is available (e.g. http://www.cencoos.org/sections/conditions/CENCAL_currents/mb_node.shtml). Adding data before Oct. 4, 2010, is also planned in the near future.

About the tool development process

The idea for this trajectory tool came from repeated requests from researchers, resource managers and emergency responders for a tool to aid in: search and rescue operation, oil spill response, contaminant tracking, fishery *larval dispersal*, recreational boating, community education and outreach. The initial funding to develop this trajectory tool was provided by CeNCOOS (www.cencoos.org). Subsequent funding from the Alaska Ocean Observing System (AOOS, www.aoos.org) and the Southern California Coastal Ocean Observing System (SCCOOS, www.sccoos.org) helps to refine this tool.

If you have any questions or experience problems with this tool, please contact the Principal Investigator of this project (Yi.Chao@jpl.nasa.gov). Any comments, feedback or suggestions are also appreciated.